Sheetname: Power_Management

File: Power_Management.kicad_sch

MCU

File: MCU.kicad_sch

MCU_Interfaces

File: MCU_Interfaces.kicad_sch

Level_Shifters

File: Level_Shifters.kicad_sch

Sensors

File: Sensors.kicad_sch

Heater_Drivers

File: Heater_Drivers.kicad_sch

Fan_Drivers

File: Fan_Drivers.kicad_sch

Stepper_Driver_0

File: Stepper_Driver_0.kicad_sch

Stepper_Driver_1

File: Stepper_Driver_1.kicad_sch

Stepper_Driver_2

File: Stepper_Driver_2.kicad_sch

Stepper_Driver_3

File: Stepper_Driver_3.kicad_sch

Miscellaneous

File: Miscellaneous.kicad_sch

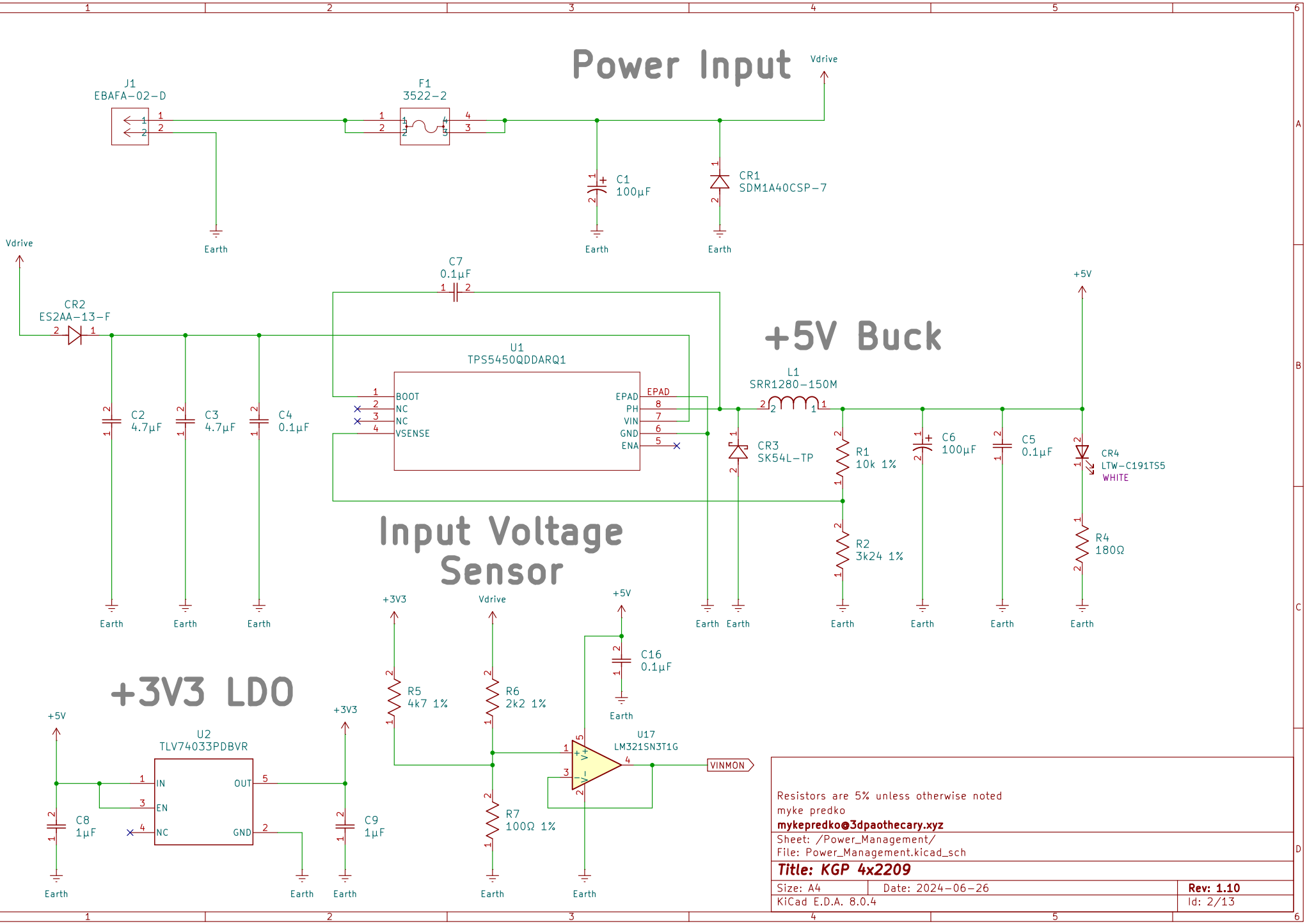
Resistors are 5% unless otherwise noted

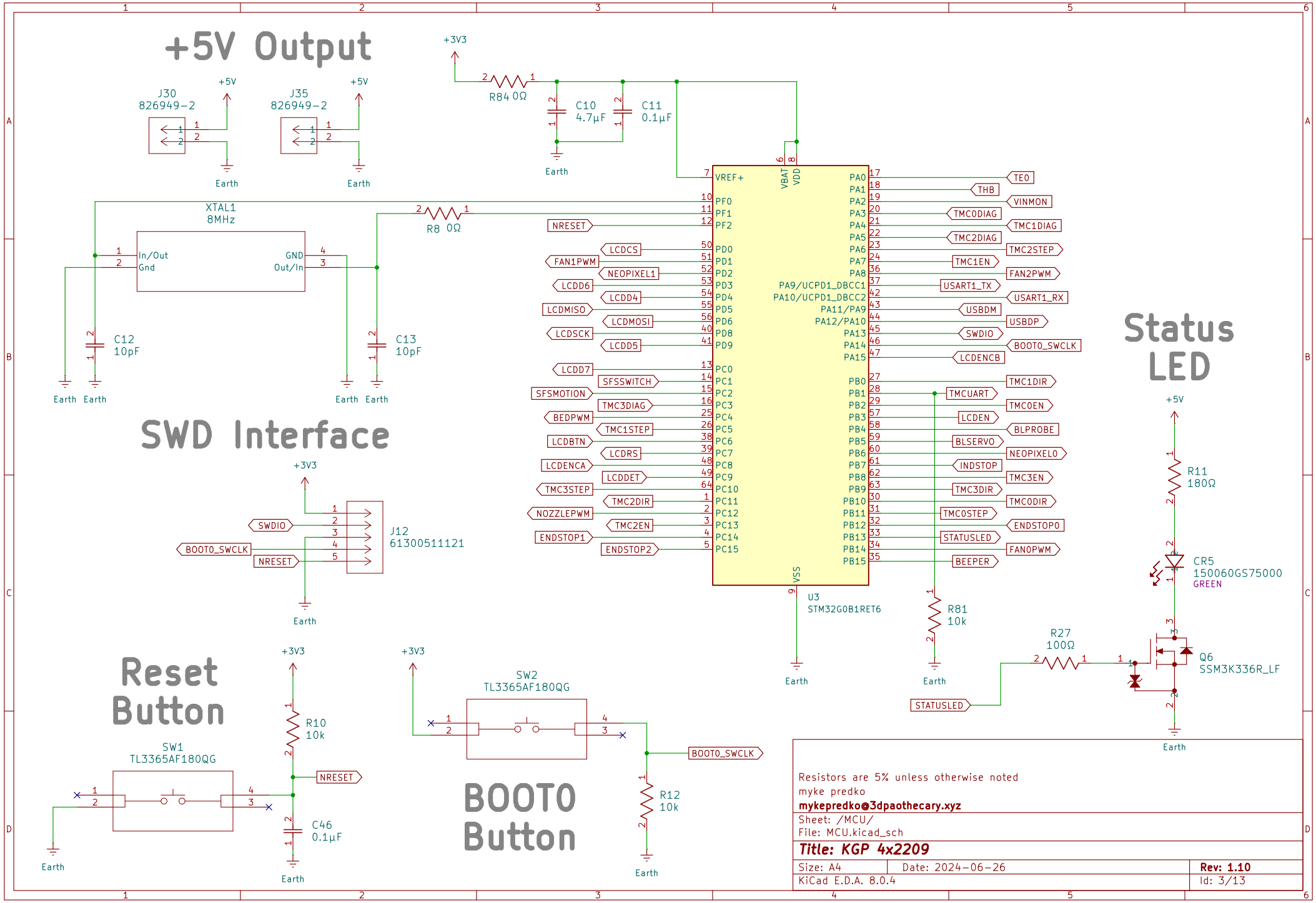
myke predko
mykepredko@3dpaothecary.xyz

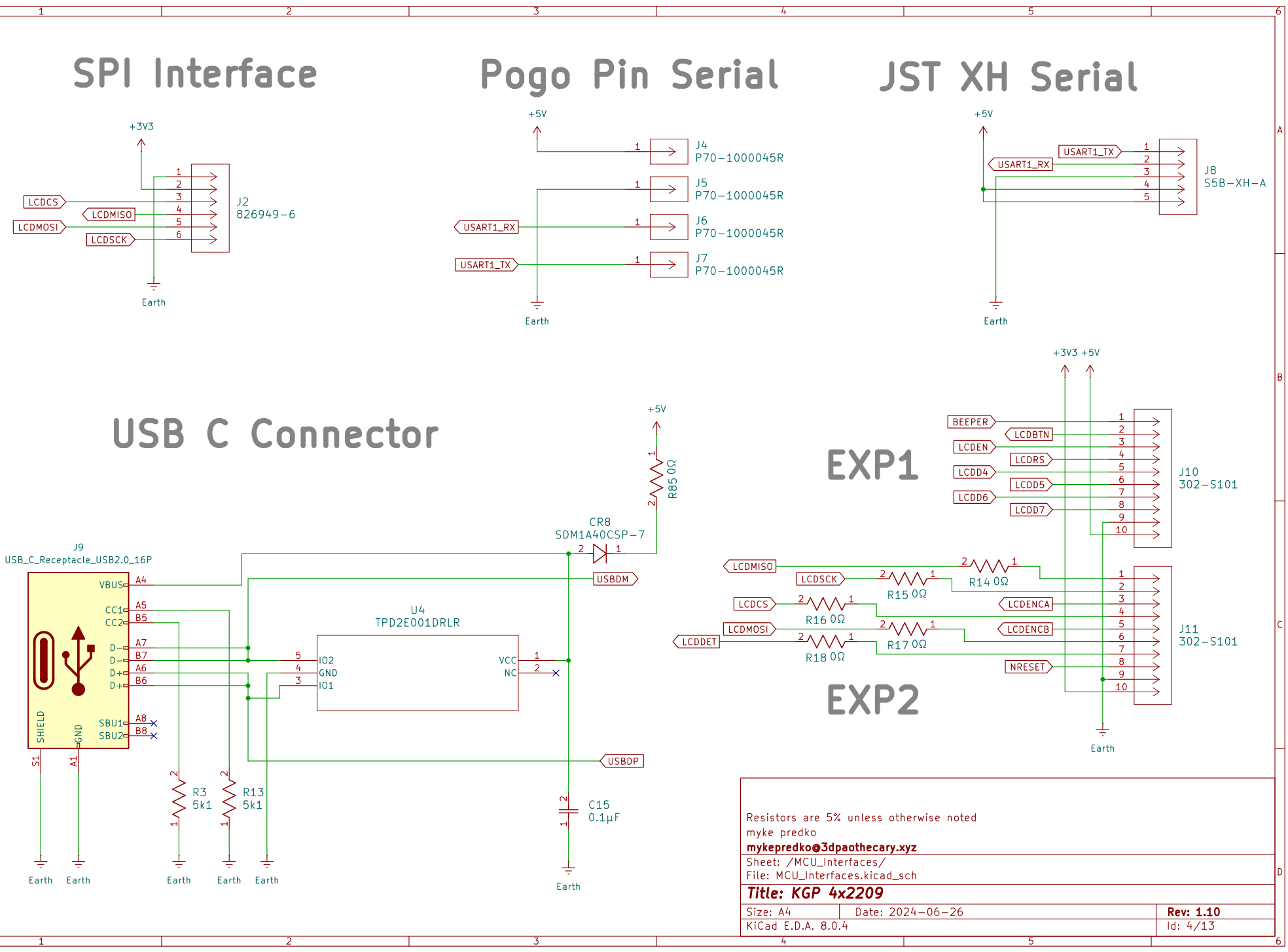
Sheet: /
File: Project.kicad_sch

Title: KGP 4x2209

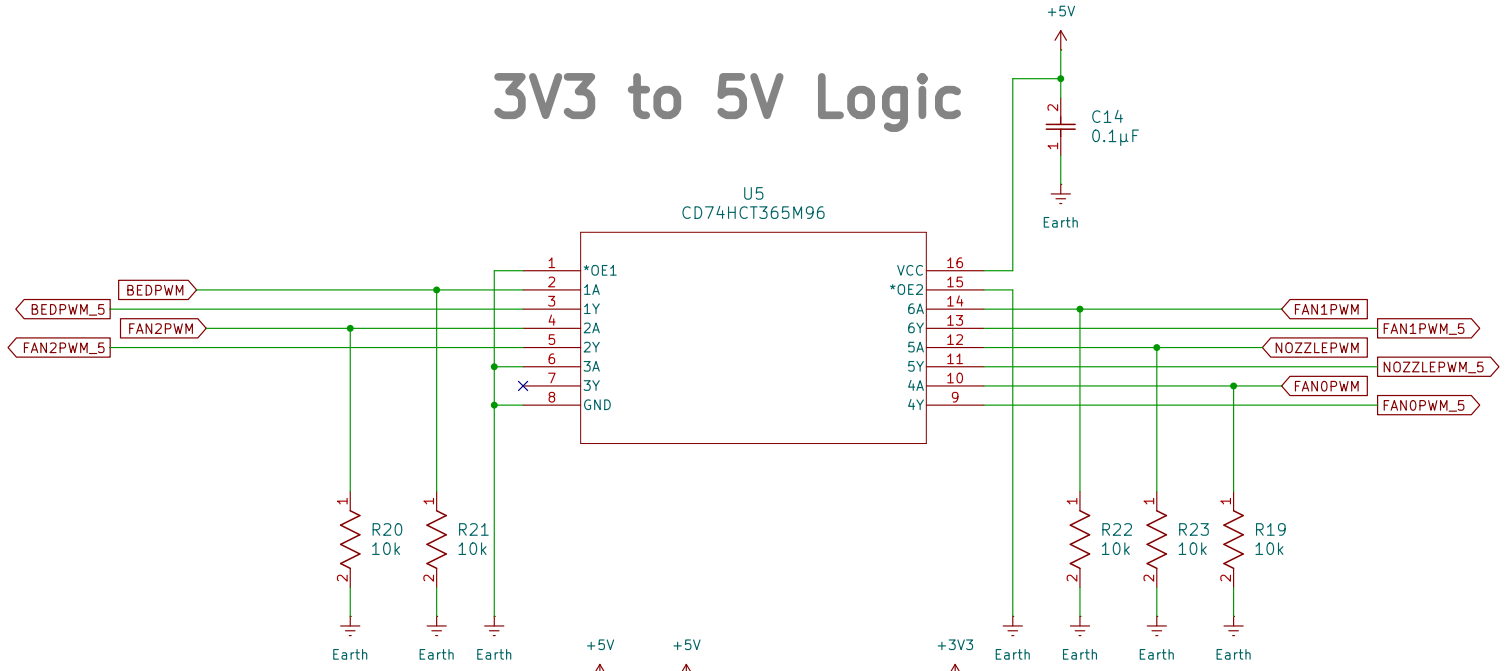
Size: A4	Date: 2024-06-26	**Rev: 1.10**
KiCad E.D.A. 8.0.4		Id: 1/13


Power Input
J1
EBAFA-02-D
F1
3522-2
Vdrive
C1
100µF
CR1
SDM1A40CSP-7
Earth
+5V Buck
CR2
ES2AA-13-F
C7
0.1µF
U1
TPS5450QDDARQ1
BOOT
NC
NC
VSENSE
EPAD
PH
VIN
GND
ENA
L1
SRR1280-150M
C2
4.7µF
C3
4.7µF
C4
0.1µF
CR3
SK54L-TP
R1
10k 1%
R2
3k24 1%
C6
100µF
C5
0.1µF
CR4
LTW-C191TS5
WHITE
R4
180Ω
+5V
Input Voltage Sensor
+3V3
R5
4k7 1%
R6
2k2 1%
R7
100Ω 1%
C16
0.1µF
U17
LM321SN3T1G
VINMON
+3V3 LDO
U2
TLV74033PDBVR
IN
EN
NC
OUT
GND
C8
1µF
C9
1µF
Resistors are 5% unless otherwise noted
myke predko
mykepredko@3dpaothecary.xyz
Sheet: /Power_Management/
File: Power_Management.kicad_sch
Title: KGP 4x2209
Size: A4
Date: 2024-06-26
Rev: 1.10
KiCad E.D.A. 8.0.4
Id: 2/13

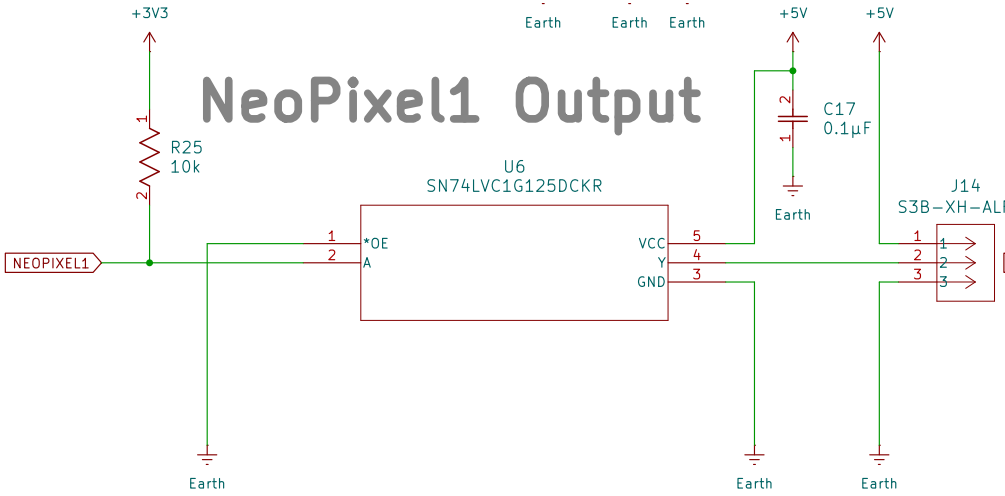

+5V Output
J30
826949-2
J35
826949-2
+5V
Earth
+3V3
R84 0Ω
C10
4.7µF
C11
0.1µF
XTAL1
8MHz
In/Out
Gnd
GND
Out/In
R8 0Ω
C12
10pF
C13
10pF
SWD Interface
J12
61300511121
SWDIO
BOOT0_SWCLK
NRESET
Reset
Button
SW1
TL3365AF180QG
R10
10k
C46
0.1µF
SW2
TL3365AF180QG
BOOT0
Button
R12
10k
U3
STM32G0B1RET6
VREF+
VBAT
VDD
VSS
PF0
PF1
PF2
PD0
PD1
PD2
PD3
PD4
PD5
PD6
PD8
PD9
PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7
PC8
PC9
PC10
PC11
PC12
PC13
PC14
PC15
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PA8
PA9/UCPD1_DBCC1
PA10/UCPD1_DBCC2
PA11/PA9
PA12/PA10
PA13
PA14
PA15
PB0
PB1
PB2
PB3
PB4
PB5
PB6
PB7
PB8
PB9
PB10
PB11
PB12
PB13
PB14
PB15
LCDCS
FAN1PWM
NEOPIXEL1
LCDD6
LCDD4
LCDMISO
LCDMOSI
LCDSCK
LCDD5
LCDD7
SFSSWITCH
SFSMOTION
TMC3DIAG
BEDPWM
TMC1STEP
LCDBTN
LCDRS
LCDENCA
LCDDET
TMC3STEP
TMC2DIR
NOZZLEPWM
TMC2EN
ENDSTOP1
ENDSTOP2
TE0
THB
VINMON
TMC0DIAG
TMC1DIAG
TMC2DIAG
TMC2STEP
TMC1EN
FAN2PWM
USART1_TX
USART1_RX
USBDM
USBDP
SWDIO
BOOT0_SWCLK
LCDENCB
TMC1DIR
TMCUART
TMC0EN
LCDEN
BLPROBE
BLSERVO
NEOPIXEL0
INDSTOP
TMC3EN
TMC3DIR
TMC0DIR
TMC0STEP
ENDSTOP0
STATUSLED
FAN0PWM
BEEPER
Status
LED
R11
180Ω
CR5
150060GS75000
GREEN
R81
10k
R27
100Ω
Q6
SSM3K336R_LF
Resistors are 5% unless otherwise noted
myke predko
mykepredko@3dpaothecary.xyz
Sheet: /MCU/
File: MCU.kicad_sch
Title: KGP 4x2209
Size: A4
Date: 2024-06-26
Rev: 1.10
KiCad E.D.A. 8.0.4
Id: 3/13


SPI Interface
+3V3
LCDCS
LCDMISO
LCDMOSI
LCDSCK
J2
826949-6
Earth
Pogo Pin Serial
+5V
J4
P70-1000045R
J5
P70-1000045R
USART1_RX
J6
P70-1000045R
USART1_TX
J7
P70-1000045R
Earth
JST XH Serial
+5V
USART1_TX
USART1_RX
J8
S5B-XH-A
Earth
USB C Connector
J9
USB_C_Receptacle_USB2.0_16P
VBUS
CC1
CC2
D-
D-
D+
D+
SBU1
SBU2
SHIELD
GND
S1
A1
R3
5k1
R13
5k1
U4
TPD2E001DRLR
IO2
GND
IO1
VCC
NC
CR8
SDM1A40CSP-7
R85 0Ω
+5V
USBDM
USBDP
C15
0.1µF
Earth
EXP1
EXP2
+3V3 +5V
BEEPER
LCDBTN
LCDEN
LCDRS
LCDD4
LCDD5
LCDD6
LCDD7
J10
302-S101
LCDMISO
LCDSCK
LCDCS
LCDMOSI
LCDDET
R14 0Ω
R15 0Ω
R16 0Ω
R17 0Ω
R18 0Ω
LCDENCA
LCDENCB
NRESET
J11
302-S101
Earth
Resistors are 5% unless otherwise noted
myke predko
mykepredko@3dpaothecary.xyz
Sheet: /MCU_Interfaces/
File: MCU_Interfaces.kicad_sch
Title: KGP 4x2209
Size: A4
Date: 2024-06-26
Rev: 1.10
KiCad E.D.A. 8.0.4
Id: 4/13

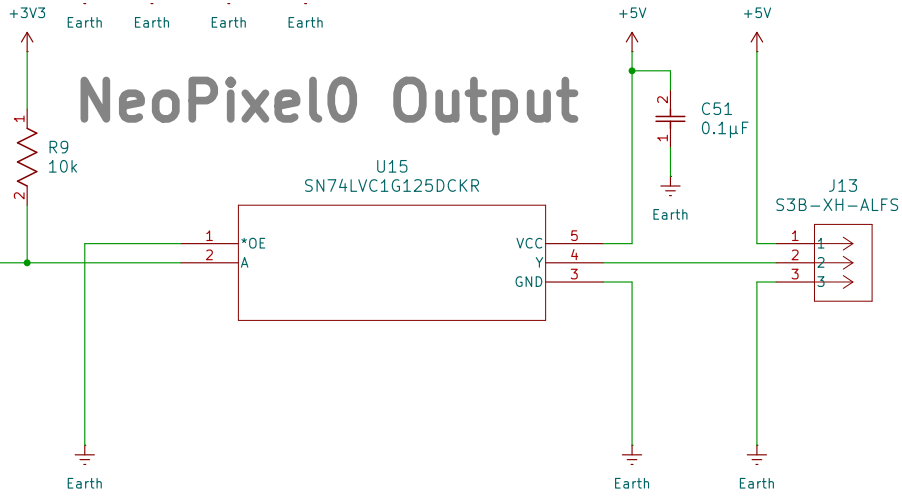
3V3 to 5V Logic



NeoPixel1 Output



NeoPixel0 Output



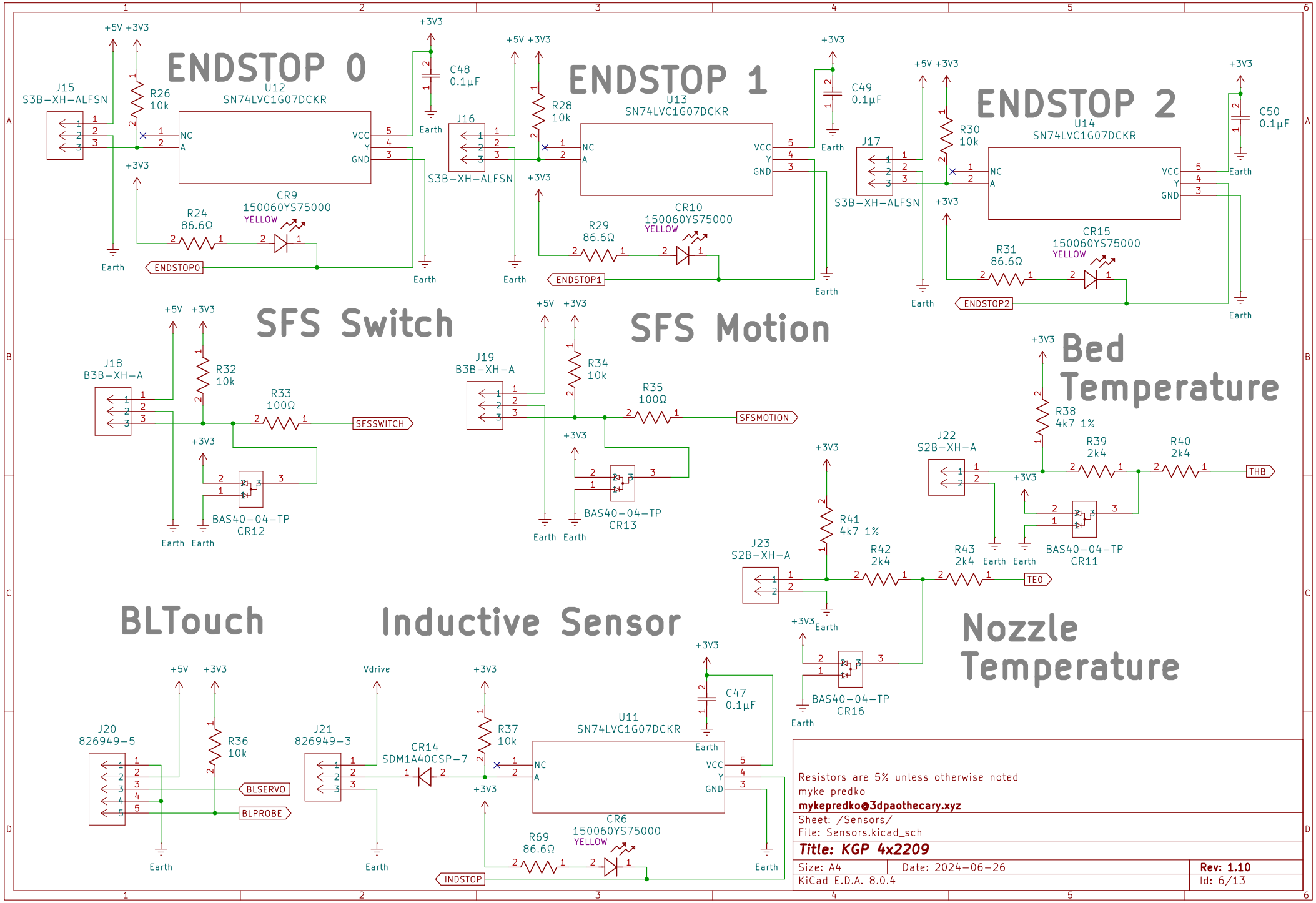
Resistors are 5% unless otherwise noted

myke predko
mykepredko@3dpaothecary.xyz

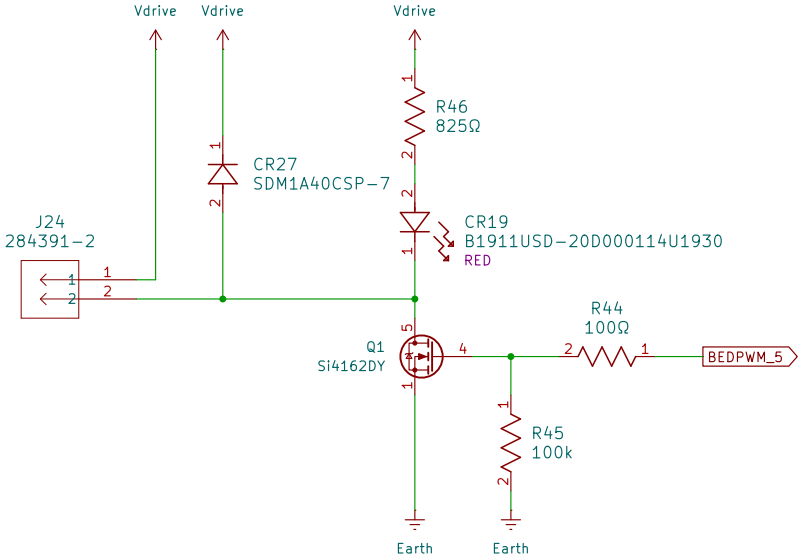
Sheet: /Level_Shifters/
File: Level_Shifters.kicad_sch

Title: KGP 4x2209

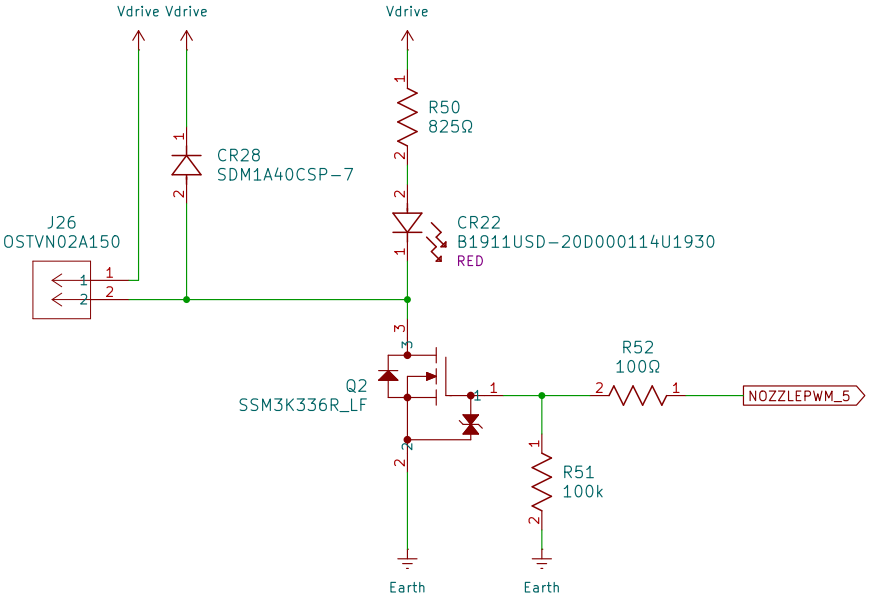
Size: A4	Date: 2024-06-26	**Rev: 1.10**
KiCad E.D.A. 8.0.4		Id: 5/13


ENDSTOP 0
J15
S3B-XH-ALFSN
R26
10k
U12
SN74LVC1G07DCKR
C48
0.1µF
R24
86.6Ω
CR9
150060YS75000
YELLOW
ENDSTOP0
ENDSTOP 1
J16
S3B-XH-ALFSN
R28
10k
U13
SN74LVC1G07DCKR
C49
0.1µF
R29
86.6Ω
CR10
150060YS75000
YELLOW
ENDSTOP1
ENDSTOP 2
J17
S3B-XH-ALFSN
R30
10k
U14
SN74LVC1G07DCKR
C50
0.1µF
R31
86.6Ω
CR15
150060YS75000
YELLOW
ENDSTOP2
SFS Switch
J18
B3B-XH-A
R32
10k
R33
100Ω
SFSSWITCH
BAS40-04-TP
CR12
SFS Motion
J19
B3B-XH-A
R34
10k
R35
100Ω
SFSMOTION
BAS40-04-TP
CR13
Bed Temperature
J22
S2B-XH-A
R38
4k7 1%
R39
2k4
R40
2k4
THB
BAS40-04-TP
CR11
Nozzle Temperature
J23
S2B-XH-A
R41
4k7 1%
R42
2k4
R43
2k4
TE0
BAS40-04-TP
CR16
BLTouch
J20
826949-5
R36
10k
BLSERVO
BLPROBE
Inductive Sensor
J21
826949-3
CR14
SDM1A40CSP-7
R37
10k
U11
SN74LVC1G07DCKR
C47
0.1µF
R69
86.6Ω
CR6
150060YS75000
YELLOW
INDSTOP
Resistors are 5% unless otherwise noted
myke predko
mykepredko@3dpaothecary.xyz
Sheet: /Sensors/
File: Sensors.kicad_sch
Title: KGP 4x2209
Size: A4
Date: 2024-06-26
Rev: 1.10
KiCad E.D.A. 8.0.4
Id: 6/13

Bed Heater Driver



Extruder Heater Driver



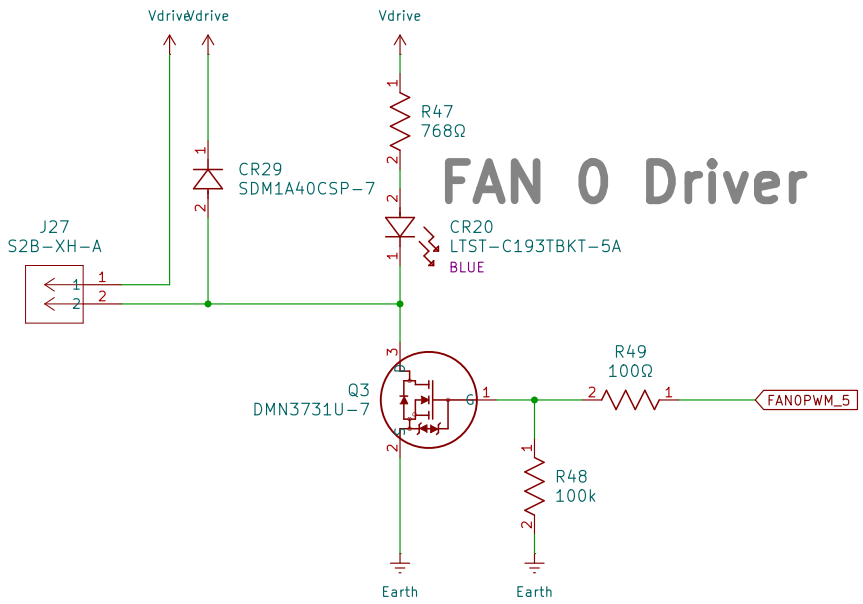
Resistors are 5% unless otherwise noted

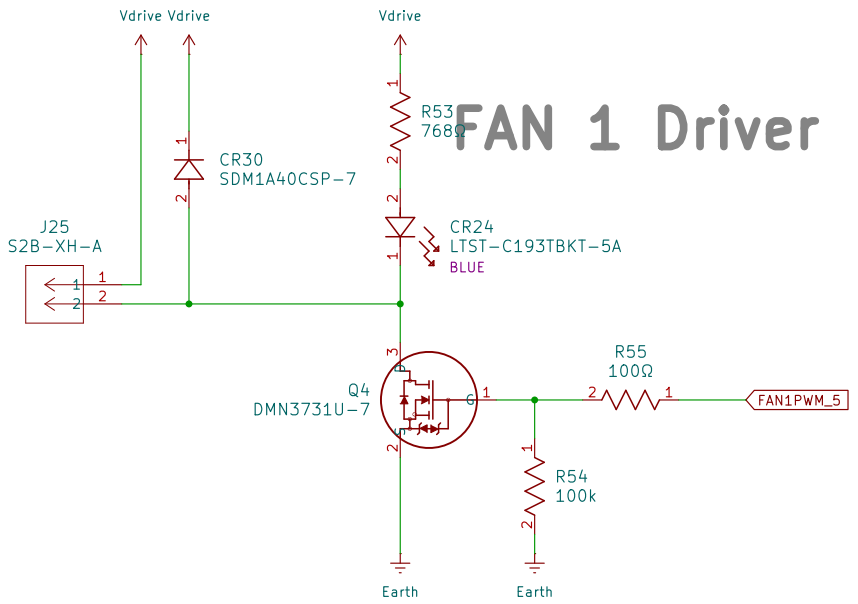
myke predko
mykepredko@3dpaothecary.xyz

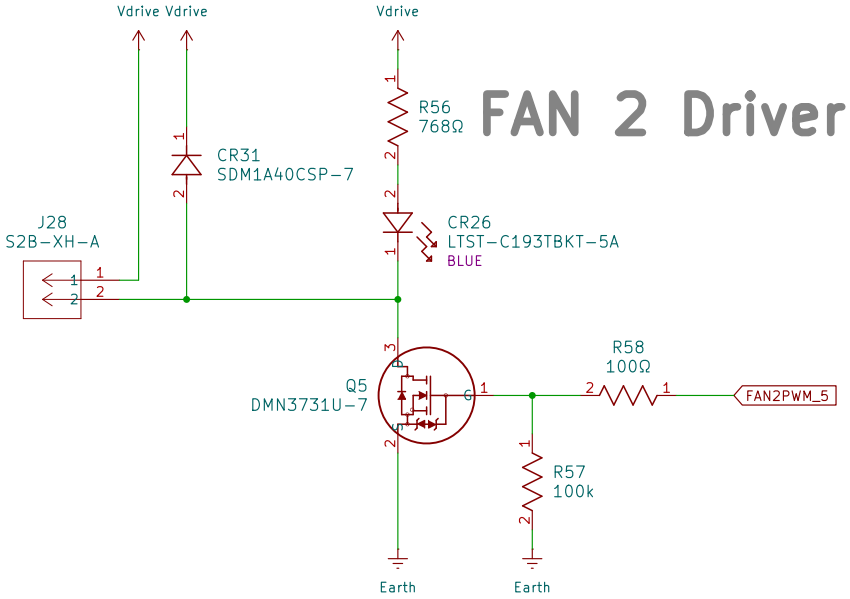
Sheet: /Heater_Drivers/
File: Heater_Drivers.kicad_sch

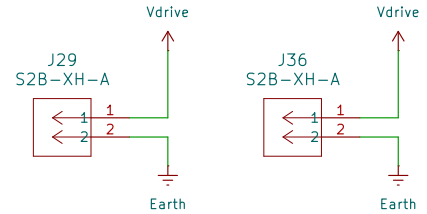
Title: KGP 4x2209

Size: A4	Date: 2024-06-26	**Rev: 1.10**
KiCad E.D.A. 8.0.4		Id: 7/13









Resistors are 5% unless otherwise noted

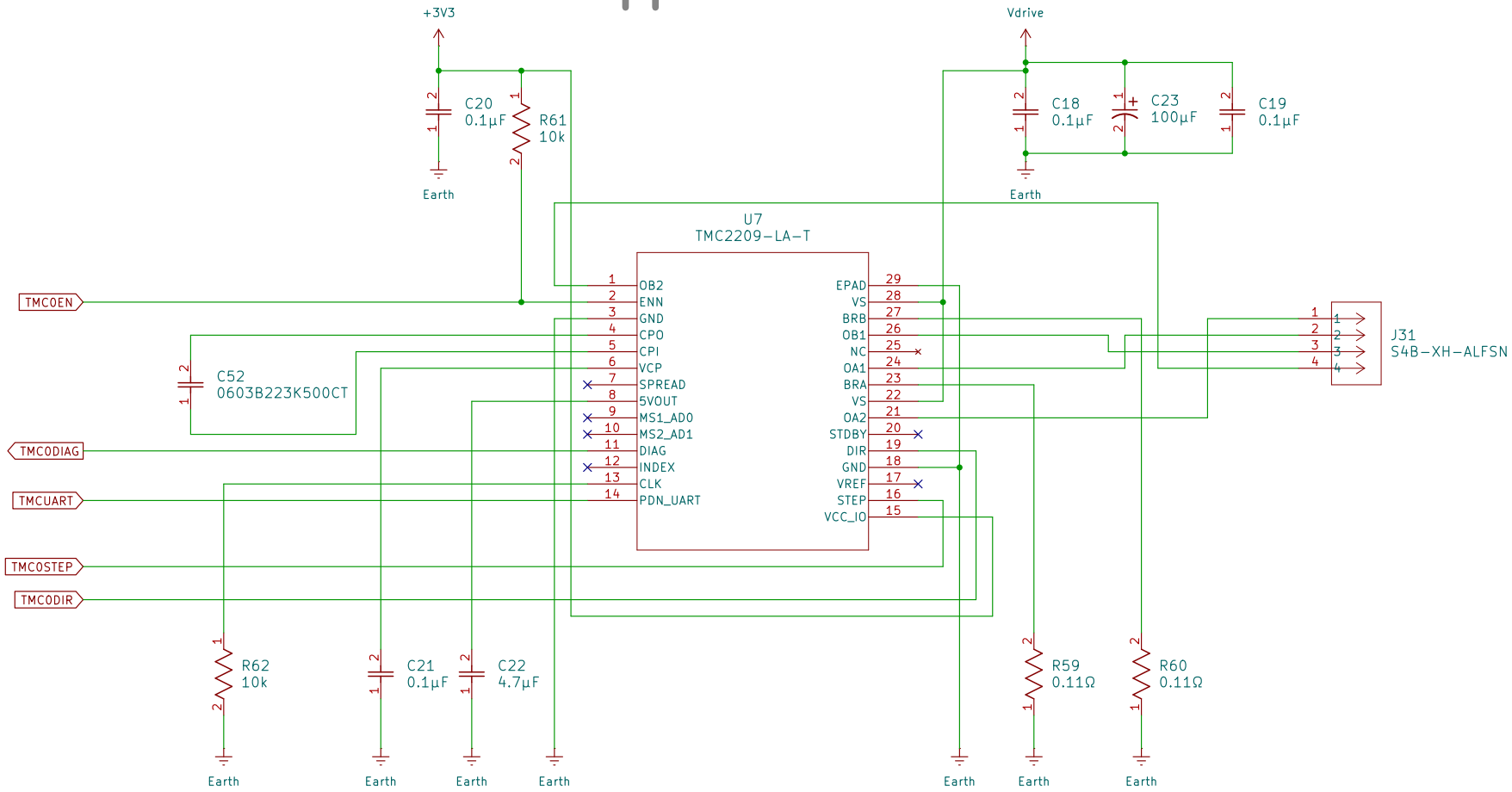
myke predko
mykepredko@3dpaothecary.xyz

Sheet: /Fan_Drivers/
File: Fan_Drivers.kicad_sch

Title: KGP 4x2209

Size: A4	Date: 2024-06-26	**Rev: 1.10**
KiCad E.D.A. 8.0.4		Id: 8/13

Stepper Driver 0



Resistors are 5% unless otherwise noted

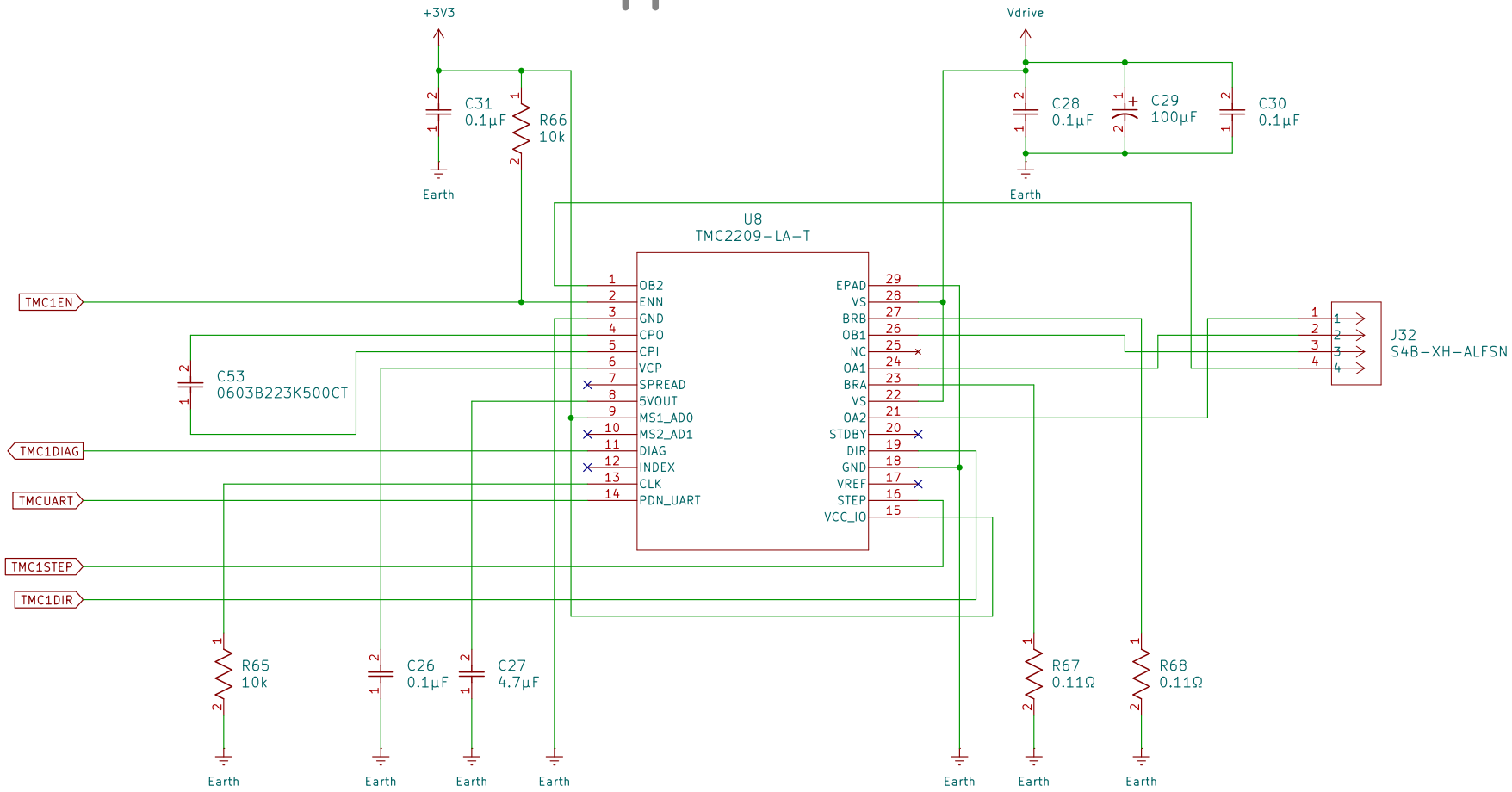
myke predko
mykepredko@3dpaothecary.xyz

Sheet: /Stepper_Driver_0/
File: Stepper_Driver_0.kicad_sch

Title: KGP 4x2209

Size: A4	Date: 2024-06-26	**Rev: 1.10**
KiCad E.D.A. 8.0.4		Id: 9/13

Stepper Driver 1



Resistors are 5% unless otherwise noted

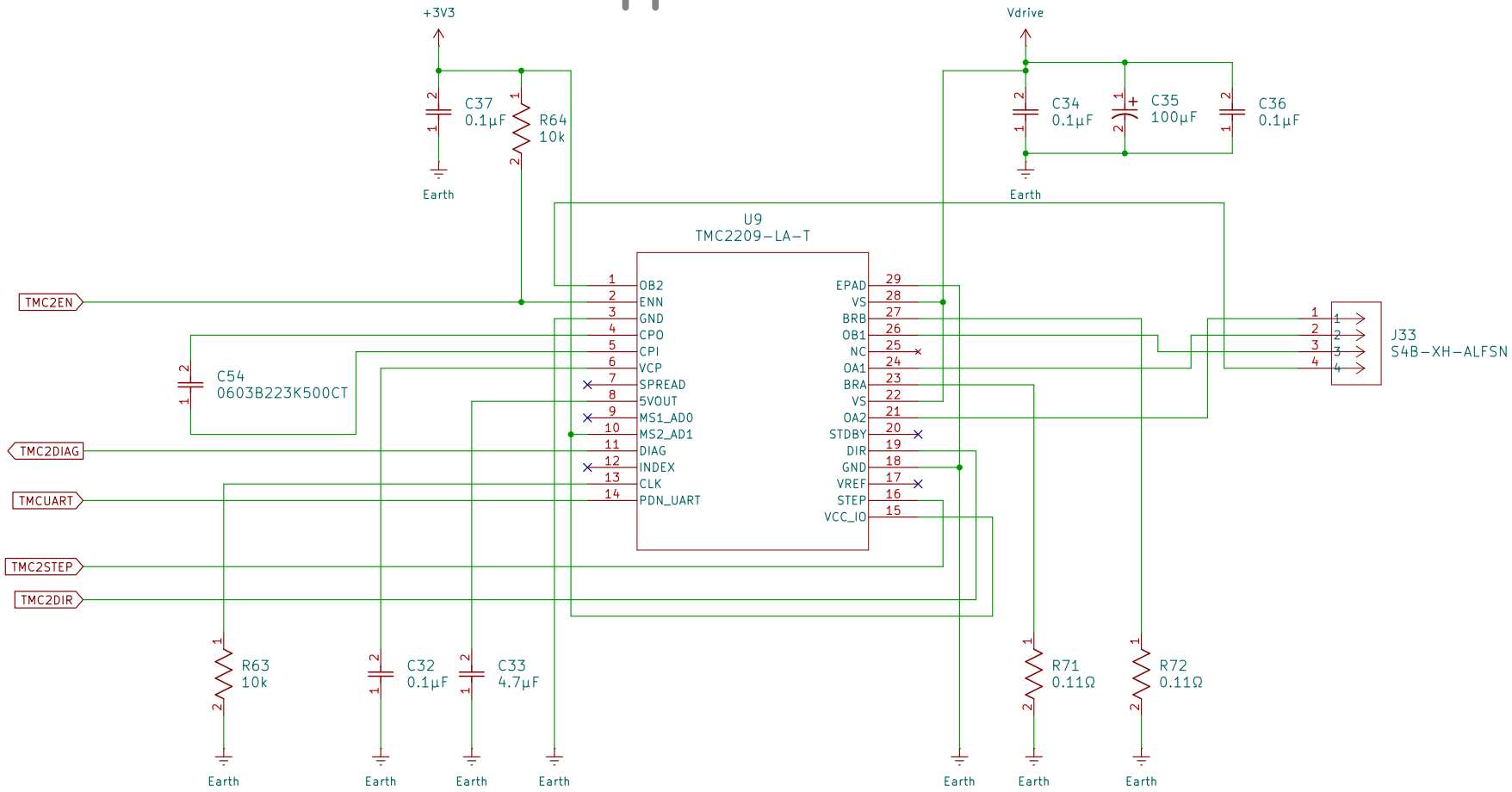
myke predko
mykepredko@3dpaothecary.xyz

Sheet: /Stepper_Driver_1/
File: Stepper_Driver_1.kicad_sch

Title: KGP 4x2209

Size: A4	Date: 2024-06-26	**Rev: 1.10**
KiCad E.D.A. 8.0.4		Id: 10/13

Stepper Driver 2



Resistors are 5% unless otherwise noted

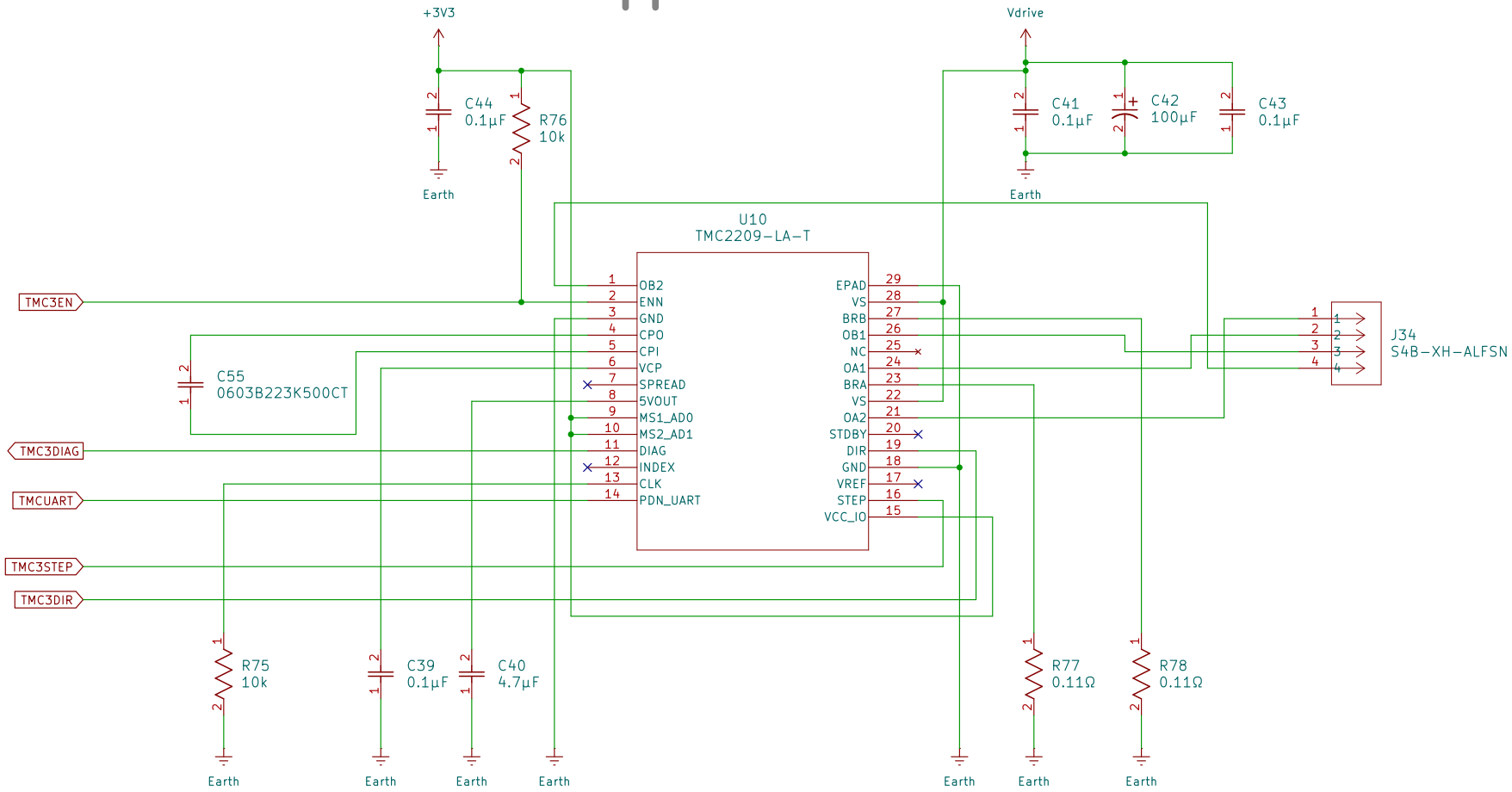
myke predko
mykepredko@3dpaothecary.xyz

Sheet: /Stepper_Driver_2/
File: Stepper_Driver_2.kicad_sch

Title: KGP 4x2209

Size: A4	Date: 2024-06-26	**Rev: 1.10**
KiCad E.D.A. 8.0.4		Id: 11/13

Stepper Driver 3



Resistors are 5% unless otherwise noted

myke predko
mykepredko@3dpaothecary.xyz

Sheet: /Stepper_Driver_3/
File: Stepper_Driver_3.kicad_sch

Title: KGP 4x2209

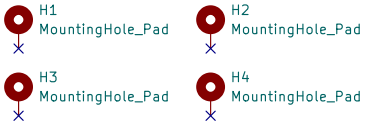
Size: A4	Date: 2024-06-26	**Rev: 1.10**
KiCad E.D.A. 8.0.4		Id: 12/13

Notes:

1. The 0Ω Resistors on the MCU power and VBUS lines are for checking current flow as well as the need for a common mode choke.
2. All 0Ω Resistors on SPI Lines are to be removed and BTT UI board function without them is to be tested. The board should work except for SD Card (which is not required in Klipper).
3. Try MOSFETs without the 5V Level Shift. The Toshiba SSM3K56FS,LF and other MOSFETs used for the fans should work with a 3.3V "High" quite nicely. The Diodes Incorporated DMN2056U-7 is something else to consider for the fans. Still looking for something for the bed and extruder heaters.
4. ST Indicates that the Pull Up on Reset (R10) for the STM32G0B1 is NOT REQUIRED. Remove and test board operation without it (Including SWD Operation).
5. Look at how 100Ω resistors are used and ensure they are neccesary.
6. Test the need of U5, Hex inverting buffer used for level shifting.
7. Evaluate SN74LVC1G07DCKR to replace U6 & U15 (NeoPixel Drivers).
8. Is SWD required for this board? Can it be shared with a DO (STATUS LED)
9. Is L1 too large (Physically and Current Wise)?
10. Should the Stepper Driver 100µF Capacitors be replaced with two 47µF Caps as is shown in the TMC2209 Datasheet?
11. NOTE: the LM741 on VINMON has a 5V supply rather than 3V3. Same when going to use it for the Thermistor sensors.
12. Need to use the flood for the Stepper Driver output Copper
13. Should there be Thermal Reliefs for the High Current pins?
14. On Future Boards, make the Extruder and Bed MOSFET the same
15. Move EXP1 and EXP2 into the Board center to save perimeter space
16. Look at BL Touch pins and determine if either are strictly Input/Output
17. Move Serial Port to the Inside of the board
18. Goal is to have an I2C Port on the board
19. The FootSDM1A40CSP-7 Footprint has reversed Pin Numbers. This affects: CR1/CR8/CR14/CR27/CR28/CR29/CR30/CR31
20. On future boards, STATUSLED should be the SWDIO Pin
21. Use the smaller blade fuses on future boards
22. Why doesn't the board go into DFU mode when Reset with BOOT0?
23. Add White Space for Writing with a Sharpie on
24. Add 1mm between connectors for visual spacing
25. For Power, Put in Ring Terminal Blocks, Not the Squeeze Type
26. EXP1/J10 & EXP2/J11 Connectors put in reversed. Need to mark orientation on Silkscreen
27. Figure out how big the TMC2209 Keep Out Area should be. Also check to see if passives are low enough to be in this area

Fiducials

Mounting Holes



Wurth 9774027151R Standoffs

28. What is the SPI1 Error when trying to work with the mini12864 boards? Where can I find the default SPI1 IO pins?
29. Check Pogo Placement relative to the standoffs
30. Label SWD IO Pins (and Pin 1) on Silkscreen

Resistors are 5% unless otherwise noted

myke predko
mykepredko@3dpaothecary.xyz

Sheet: /Miscellaneous/
File: Miscellaneous.kicad_sch

Title: KGP 4x2209

Size: A4	Date: 2024-06-26	**Rev: 1.10**
KiCad E.D.A. 8.0.4		Id: 13/13